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UNDERNUTRITION AMONG PULMONARY TUBERCULOSIS PATIENTS IN WEST TRIPURA: A CROSS SECTIONAL STUDY.

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ABSTRACT

Title: Undernutrition Among Pulmonary Tuberculosis Patients in West Tripura: A Cross Sectional Study. **Introduction**: Tuberculosis is associated with various socioeconomic factors such as poverty, poor housing and economic deprivation which lead to poor nutritional status and impaired immune function. In the 21st century, tuberculosis is still the most frequent underlying cause of wasting worldwide. **Objectives**: To study the prevalence of under nutrition and social determinants of undernutrition among PTB patients. **Methodology**: A cross sectional study was conducted among 110 PTB patients in West District of Tripura by using a semi structured interview schedule. **Result:** Prevalence of under nutrition was 59.1% among PTB patients in West district of Tripura. In logistic regression model Undernutrition had statistically strong association with caste, income, social status and duration of treatment. **Conclusion:** Under nutrition was highly prevalent among PTB patients in West district of Tripura. Nutritional support is needed for PTB patients along with treatment.

KEYWORDS: UNDERNUTRITION, PTB.

INTRODUCTION

Undernutrition increases the risk of tuberculosis (TB) and in turn TB can lead to malnutrition. Undernutrition is therefore highly prevalent among people with TB. It has been demonstrated that undernutrition is a risk factor for progression from TB infection to active TB disease and that under nutrition at the time of diagnosis of active TB is a predictor of increased risk of death and TB relapse.[1] Malnutrition and TB are both problems of considerable magnitude in most of the underdeveloped regions of the world. In the 21st century, tuberculosis is still the most frequent underlying cause of wasting worldwide.[2] India, the country with the world's largest burden of TB also has the largest global burden of under-nutrition.[3] TB pts were respectively 11&7 times more likely to have a BMI<18.5 & MAC<24cm.[4] A systematic review of six cohort studies showed a strong inverse log-linear relationship between undernutrition (defined as low body mass index [BMI]) and incidence of TB, and concluded that a low BMI was a risk factor for development of TB.[5] But no studies have been conducted to assess the status of under-nutrition among pulmonary tuberculosis patients of Tripura. Hence, the present study was conducted to study the prevalence of under nutrition among pulmonary tuberculosis patients and to assess the social determinants of under nutrition among the study population.

MATERIALS AND METHOD

The state Tripura is the third smallest state in India in terms of size and is located in the North Eastern part of India. The state has eight districts, out of which the West Tripura District is the most populous district of the state. Currently, the state has 10 tuberculosis unit and 52 designated microscopic centers. This community based cross-sectional study was conducted during November 2014 to October 2015, among 110 pulmonary tuberculosis patients residing in West Tripura district. The West Tripura District had 1(one) tuberculosis unit (TU), which was the District Tuberculosis Centre of West District. Under this TU at present there were 10(ten) designated microscopic centers (DMC), namely Anandanagar, Narshinggarh, AGMC, TMC, DTC(W), Jirania, Mohanpur, Katlamara, Ranirbazar, Mandai. The study included all the DMCs, available in west Tripura District, in the present study. Again under all those 10(ten) DMC, there were total 131 DOTS centers. A sample size of 110 was calculated based on 51% prevalence[6] with an absolute error of 10% including 10% non response. A list of the entire Category I pulmonary tuberculosis patients of age ≥18 years, registered under each DOTS center and DMCs were prepared after collecting the names from all the DMCs separately. This list was verified with the list available in District Tuberculosis Office of

West District of Tripura. A sampling frame was prepared for the registered Category I pulmonary tuberculosis patients of ≥18 years in the DOTS centers under all the DMC in West Tripura District within the period of November'2014 up to April' 2015 for initiation of treatment with DOTS therapy under RNTCP. There was total 404 Category I pulmonary tuberculosis patients registered under RNTCP. From this list 110 (one hundred and ten) Category I pulmonary tuberculosis patients were chosen, as per inclusion criteria, by simple random sampling using random number table. A predesigned, pretested, semi structured, interview schedule was used for data collection. Prestige Stediometer, measuring range is 20-205, graduation 1mm, gross weight 2.65kg, was used to measure height for each subject. Weight was measured for each subject using Dr. Gene Digital weighing scale (MS 8270), capacity up to 150kg. Ultimately BMI was calculated to assess the nutritional status of subjects. Data analysis was done manually as well as in SPSS version 15 and EPI info version 7.0. Data were expressed in frequency, percentage and statistical analysis was performed using Pearson's chi square test and Odds ratio was calculated by multiple logistic regression analysis. P value of < 0.05 was considered as statistically significant.

RESULTS

The present study included total 110 (one hundred and ten) Category I pulmonary tuberculosis patients. Distribution of study participants were compared according to socio demographic profile, socio economic variables, standard of living and under nutrition. Association of those variables with under nutrition were assessed by using Chi square test. Multiple logistic regression models were constructed to examine association between the risk of under nutrition and the factors; those were found to be significantly associated by using chi square test.

Table: 1 Socio –demographic profile of the study participants

VARIABLES		FREQUENCY (%)
Age 45(30-56)†	<40 yrs	45 (40.9)
	40-60 yrs	52 (47.3)
	>60 yrs	13 (11.8)
Gender	Male	86 (78.2)
	Female	24 (21.8)
Education	Illiterate	31 (28.2)
	Primary	40 (36.4)
	Secondary	25 (22.7)
	Higher secondary	9 (8.2)
	Graduate& above	5 (4.5)
Occupation	Employed	6 (5.5)

	Labour	52 (47.3)
	Business	13 (11.8)
	Unemployed	23 (20.9)
	Farmer	16 (14.5)
Religion	Hindu	97 (88.2)
	Others	13 (11.8)
Community /caste	General	29 (26.4)
	SC	39 (35.5)
	ST	12 (10.9)
	OBC	30 (27.3)
Per capita income (month) Rs.	<2000	68 (61.8)
	2000-4000	34 (30.9)
	>4000	8 (7.3)
No. of family members	<5	34 (30.9)
	≥5	76 (69.1)
Standard of living	High	7 (6.4)
	Medium	30 (27.3)
	Low	73 (66.4)
Treatment duration	≤ 3 months	39(35.5)
	>3 months	71(64.5)
Weight	44(39-50) †	
BMI	17(15-19) †	

† Median (IQR).

Table 1 showed that median age of the study participants were 45(30-56). Majority of the study participants were in the age group of 40-60 years (47.3%), Male (78.2%), primary educated (36.4%), belonged to Scheduled caste community (35.5%), Hindu by religion (88.2%), daily labour (47.3%), Per capita income(month) of <2000 (61.8%), with low standard of living (66.4%) and was on treatment for >3 months (64.55). Median weight of the study participants was 45(30-56) and Range of the weight was (25-70). Range of the BMI was (10.96-28.04) and Median (IQR) BMI was 17(15-19).

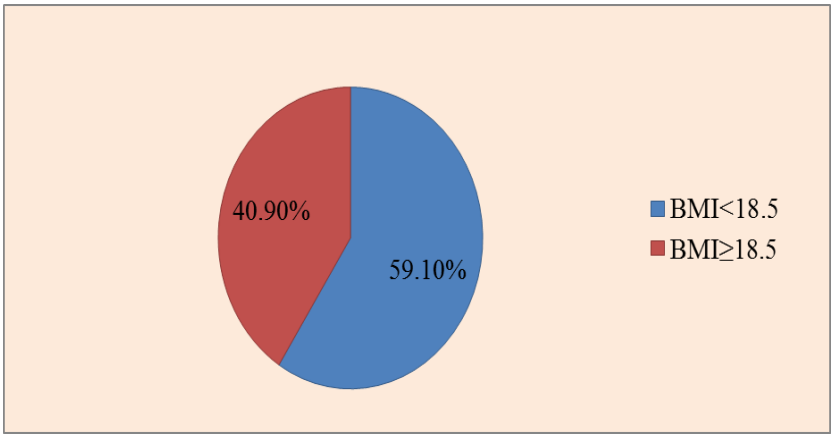

FIG 1: Pie chart showing prevalence of under nutrition

The present study revealed that the overall prevalence of under nutrition among the pulmonary tuberculosis patients was 59.1%.(FIG 1).

Table 2: Multiple logistic regression analysis of predictors for undernutrition

PREDICTORS		ODDS RATIO	P-VALUE
Age in years	<40	1.017(0.973-1.201)	.068
	40-60	2.082(1.376-4.055)	.001
	>60 (Ref)		
Education	Illiterate	3.431(0.674-4.282)	.088
	Primary	2.214(0.044-2.894)	.207
	Secondary	0.907(0.347-2.312)	.240
	Higher secondary	0.816(0.117-1.695)	.159
	Graduate and above		
Occupation	labours	1.638(0.637-1.920)	.145
	Unemployed	0.649(0.272-1.037)	.979
	Employee (Ref)		
Percapita income Rs.	<2000	2.704(1.535-3.671)	.039
	2000-4000	2.124(0.889-2.167)	.973
	>4000(Ref)		
Standard of living	low	2.113(1.395-3.143)	.024
	medium	1.809(0.313-2.049)	.086
	High(Ref)		
Treatment duration	≤3months	1.992(1.045-2.192)	.047
	>3months(Ref)		

Multivariable logistic regression model included the factors like age, occupation, educational Status, socio economic class to identify the socio-economic factors associated with undernutrition among pulmonary tuberculosis pateints. Multivariable logistic regression analyses revealed that undernutrition has strong statistical association [OR=2.082;(P=0.001)] with age. Participants with per capita family income of Rs. <2000 had 2.7 times higher chance of undernutrition and this association was statistically significant [OR= 2.704 (P=0.039)]. Participants with low Standard of living and those were on treatment for ≤3months had almost 2 times higher chance of being malnourished. (Table 2).

DISCUSSION

In the present study majority of the study participants were in the age group of 40-60 years (47.3%), Male (78.2%). Similar finding were obtained from a study[7] conducted in Tamilnadu. Similar male dominance for pulmonary tuberculosis was found in studies conducted by Phalke Deepak Baburao et al[8], at DOTs centreLoni, from 2006-08, (66% males v/s 34% females). In the present study majority of the study participants were Hindu by religion (88.2%). Similarly in another study[9] majority of study subjects were Hindu by

religion and sputum positivity was also more among Hindus i.e. (40.1%). Present study revealed majority of the study participants had primary education (36.4 %). Similarly in another study more than two thirds of the participants (69.3%) had low level educational backgrounds of mainly primary and secondary education.[10] The present study showed that majority of the participants (35.5%). Similarly in another study[8], sputum positive results were more among schedule caste i.e. 50%, followed by 37% in general category subjects and 36.1% in OBC subjects. AartiKaulagekar and Anjali Radkar in their study "Social status makes a difference: tuberculosis scenario during National family health survey – 2", conducted at Pune **(**1998-99**)**, reported a descending order of prevalence among different casts i.e. scheduled tribes1.85%, scheduled castes 0.64%, other backward castes 0.54% and other advanced caste groups 0.43%.[11] The present study revealed that majority of the participants were daily labour (47.3%) and Per capita income (month) of <2000 (61.8%). Similar findings were obtained from another study conducted by M. Muniyandi[8] The present study revealed that the overall prevalence of under nutrition among the pulmonary tuberculosis patients was 59.1%. Similarly about 38.5% were wasted (i.e. body mass index of <18.5 kg/m2) in a study[12] conducted among TB patients in Kampala Uganda. Another study[7] found almost similar result where 72.9% cases had under nutrition, i.e. BMI < 18.5 Kg/Square. metre. Multivariable logistic regression analyses revealed that undernutrition has strong statistical association [OR=2.082;(P=0.001)] with age. Participants with per capita family income of Rs. <2000 had 2.7 times higher chance of under nutrition and this association was statistically significant [OR= 2.704 (P=0.039)]. Participants with low Standard of living and those were on treatment for ≤3months had almost 2 times higher chance of being malnourished. Multivariate analysis of another study[6] revealed that illiteracy [adjusted OR (AOR) 1.65; 95% CI, 1.11-2.46], alcohol consumption (AOR 1.48; 95% CI, 0.94-2.33), history of TB patient within the family (AOR 1.82; 95% CI, 1.25 - 2.65), irregular income (AOR 1.78; 95% CI, 1.18-2.67) and a lower BMI (< 18.5 kg/m2) (AOR 3.41; 95% CI, 2.32-4.99) were independent risk factors for PTB.

CONCLUSION

Pulmonary Tuberculosis affects mainly the productive age group of society thus it hampers the social and economical development of individual, society and the nation. It was mostly seen in the lower and below middle class community which are already struggling for their survival in day to day life. Improving the living standard of people can significantly lessen the risk of TB. Under nutrition was highly prevalent among PTB patients in West district of

Tripura. Nutritional status was statistically significant with Age, income, social status and duration of treatment. Nutritional supplementation may represent a novel approach for fast recovery in tuberculosis patients. Raising nutritional status of population may prove to be an effective measure to control tuberculosis in underdeveloped areas of world.

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